

FLIGHT

The
**AIRCRAFT
ENGINEER
&
AIRSHIPS**

First Aero Weekly in the World

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

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PUBLISHERS' NOTICE

Publication of last week's issue of "Flight" was delayed owing to the Binders' Sectional Strike. The Publishers beg, therefore, to state that a special stock has been reserved to supply any reader who may have failed to secure his copy through the regular channel, and copies (including the Special 16-page Supplement) will be sent post free (upon application) at the Publishers' price of 6d.

Flight

The Aircraft Engineer and Airships

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DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:—

1925

- Apr. 23 Colonel F. Searle: "The Maintenance of Commercial Aircraft," before R.Ae.S.
Apr. 24 Commander C. D. Burney, C.M.G., M.P., R.N.: "The Position of the Airship in Aerial Transport," before I.Ae.E.
Apr. 30 Wilbur Wright Lecture, Rear-Admiral D. W. Taylor: "Some Aspects of the Comparison of Model and Full-Scale Tests," before R.Ae.S.
May 8 Capt. W. H. Sayers, Hons. Member: "A Resume of Achievements in Aviation during the Past Year," before I.Ae.E.
May 7 Aero Golfing Soc. Spring Meeting, Worplesdon.
May 20 Visit to the National Physical Laboratory, Teddington, by I.Ae.E.

EDITORIAL COMMENT.



BY a curious coincidence, the date of the resumed British airship activity tallies almost exactly with the lecture given by Dr. Hugo Eckener before the Royal Aeronautical Society, or rather, the first flight by R.33 for several years is almost coincident with the reading of the paper. Consequently, interest is focussed, this week, on matters relating to lighter-than-air craft, after a long interval during which, it is to be feared, the subject of airships has been allowed to recede, as far as the general public is concerned, into the background of air activity. Although R.33's flight this week must be considered to mark a re-awakening, it should be pointed out that many months, or even years, must necessarily elapse before Great Britain can hope to take her place among the world's leading airship nations. Where the original mistake was made was, of course, in allowing airship work to be discontinued, and it may be taken for granted that this measure, dictated at the time by the indiscriminate cry for economy, will prove to have cost the country dearly, not only in money, but much more so in experience. The result is that we have now a terrific leeway to make up, and the accidents that have overtaken airships belonging to other nations do not tend to make one optimistic as regards immediate success. Italy, France, the United States, and ourselves have been the victims of serious airship catastrophes, and the relative lack of knowledge of stresses and strains in rigid airship structures must be—or ought to be—taken into account before we undertake the task of building the huge airships planned.

In reply to a question during the discussion following the reading of his paper, Dr. Eckener stated that the largest airship which the Zeppelin Company would care to undertake to construct on a basis of

past experience and without further tests would be one of about 150,000 cub. m. (5,290,000 cub. ft.). He inferred that a larger ship could not be built without introducing experimental features. Now Dr. Eckener speaks as a representative of the Zeppelin Works of Friedrichshafen, a firm with vastly greater experience in rigid airship construction than any other firm in the world; and if a ship but very little larger than those we propose to build marks the limits of what such an experienced firm considers safe, in the light of their present knowledge, it would appear to stand to reason that we should be very wary, with our limited experience, and should defer, if necessary, the actual construction of our large airships for a period in order that the fullest degree of research and experiment may be undertaken. This is a subject to which we have repeatedly called attention, and this week, on the threshold, so to speak, of the new airship era, we would again put forward our plea for the fullest and most detailed research of which our establishments are capable. At the same time, we sincerely trust that the Government will see to it that the closest possible touch is kept with the Zeppelin Company, whose assistance and advice should be invaluable.

Fortunately, we believe that those responsible for our future airship development are fully alive to the large amount of knowledge still lacking before we can confidently commence the construction of 5,000,000-cub. ft. ships, and that there is every intention to make haste slowly. The R.33 is being reconditioned at the suggestion of the Accidents Investigation Sub-Committee of the Aeronautical Research Committee and of the Airship Stressing Panel, as it was realised that our knowledge of magnitude and points of application of the forces to which an airship can be subjected was incomplete. R.33 was chosen because, for one thing, she is considered a sturdily built ship, being a copy of the German L.33, and, secondly, because a series of wind-tunnel tests have already been made of a scale model of this airship. Thus, a comparison of model and full-scale results should become possible, and should assist materially in indicating how far model figures can be applied to the full-scale airship.

Special apparatus has, we understand, been devised for the purpose of the tests, and R.33 has been fitted

up with about 200 orifices, the pressures on which during various manoeuvres will be measured and recorded simultaneously by electrical means on a number of special manometers.

Another series of tests that are planned for R.33 relate to ascertaining the mass of air which is moved with the airship, and for this test R.33 has been equipped with pointers showing the helmsman the angle on his rudders, etc. The resulting motion of the airship in space will be obtained by photographing simultaneously with a cine camera a number of instruments fitted in the control car, the reading thus obtained being further checked by flying the airship over a camera obscura on the ground on the table of which its motion is recorded.

It is thought that these various tests will go a long way towards supplying that technical information which has been lacking in the past.

The R.33, it may be remembered, was built in 1918-19 by Armstrong Whitworth and Co., at Barlow, near Selby, Yorkshire. Her overall length is 640 ft., and maximum diameter 79 ft. The capacity is 2,000,000 cub. ft., and the disposable lift is 26½ tons. It is of interest to note that a very careful examination of the Duralumin girders revealed the fact that but a very small number of parts had suffered deterioration and had to be replaced, so that apparently an airship structure is considerably more durable than generally believed.

At Pulham, which airship station is R.33's destination from Cardington, the experimental flights and tests indicated above are to be carried out, including further mooring tests. The old mooring mast has been reconditioned, and the ground gear been brought up to date, so that the mast should now be suitable for the experiments, although its low height (100 ft.) will not allow of using it for the large airships to be built, which will require a much taller mast to prevent the tail of the airships hitting the ground.

To sum up, a great deal of information is still required before we can undertake with any degree of certainty the construction of the new giants, but it appears that every effort is being made to obtain this information, and, provided the research side is not hampered by lack of funds, there should, we think, be a good chance of overcoming all difficulties and of making our new rigids a success.



Women's Royal Air Force

THE second annual reunion dinner of the Women's Royal Air Force will take place on April 4 at the Victoria Mansions Restaurant, Victoria Street, at 7.30 p.m. Dame Helen Gwynne-Vaughan, who was Commandant of the W.R.A.F., will preside. Among the guests will be Air Commodore F. C. Halahan, Wing Commander Cordingley, Colonel Birch, the Matron-in-Chief of the R.A.F. Nursing Service, etc. Women who served with the W.R.A.F., should apply for tickets to the General Secretary W.R.A.F. Old Comrades' Association, 5, Buckingham Gate, S.W.1.

The Britannia Trophy

THE Royal Aero Club have awarded to Wing Commander S. J. Goble, C.B.E., D.S.O., D.S.C., of the R.A.A.F., the Britannia Trophy for the most meritorious British flight of the year. Wing Commander Goble, with Flying Officer I. E. McIntyre, C.B.E., A.F.C., flew the entire circuit of Australia last year in 90 flying hours on a Fairey III.D seaplane, with a Rolls-Royce "Eagle VIII" engine, the same combination of machine and engine which a year previously crossed the Atlantic, piloted by the late Commander Sacadura Cabral. The flight took place without any forward organisation over unexplored territory and through great changes of climate. The machine was frequently overloaded 500 and 600 lbs., and took off in rough seas under very bad conditions. The purpose

of the flight was to explore the coast for landing places and for aircraft bases for the future coastal defence of Australia. The whole flight passed off without a hitch. In spite of the very bad weather conditions experienced and the extremes of climate passed through, the flight was carried out with the greatest promptitude and success.

To-morrow, April 3, the Directors of the Fairey Aviation Co. are giving a luncheon to Wing-Commander Goble, on the occasion of the presentation to him by the Royal Aero Club of the Britannia Trophy, at the Savoy Hotel, London.

Amundsen's Polar Flight

CAPT. R. AMUNDSEN, who is to attempt a flight to the North Pole shortly, sailed from Oslo on March 30 for Spitzbergen, where the expedition starts. The two Dornier metal flying boats to be used in the attempt are also on their way to the base.

Portuguese Flight to Africa

CAPT. PINHEIRO, who with Lieut. Sergio de Silva and Lieut. Manuel Gouveia had planned a flight from Lisbon to Portuguese Guinea in a Berguet, started on March 7, but was compelled to land in the province of Algarve and later returned to Lisbon. A fresh start was made on March 27, but unfortunately another aeroplane which was accompanying them crashed at Barcarena and the pilot, Lieut. Picarra, was killed and Lieut. Caldas and a passenger were seriously injured.

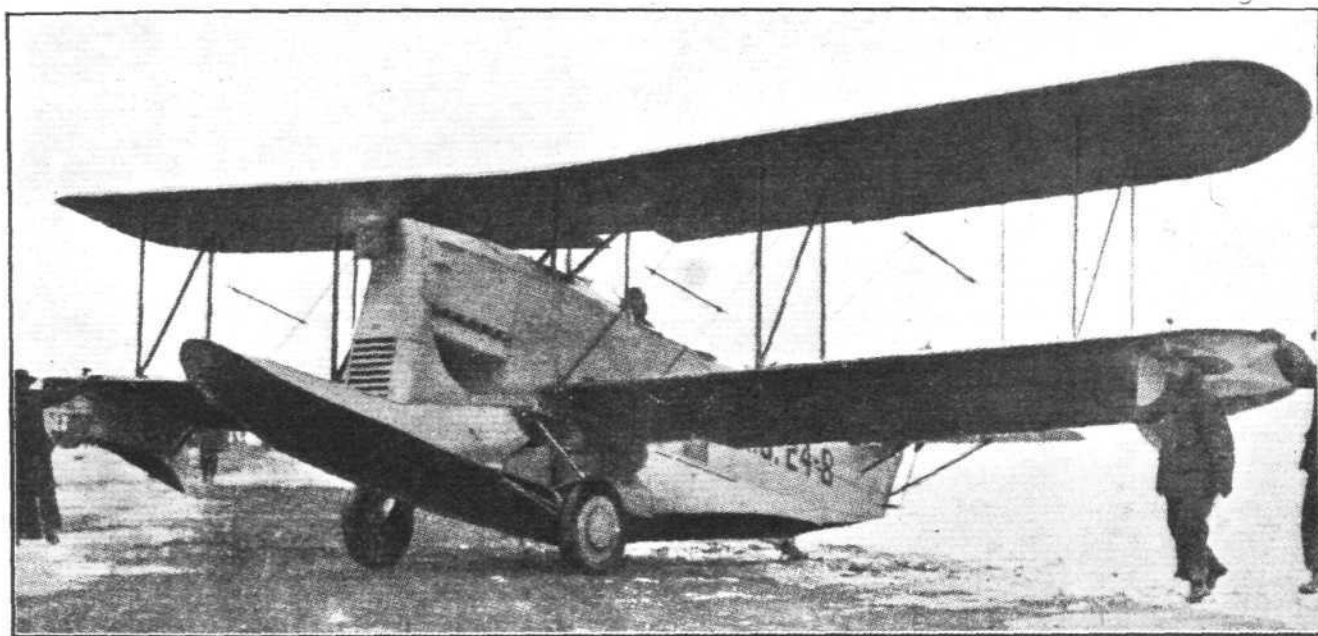
THE LOENING METAL AMPHIBIAN

A NEW type of metal amphibian, according to our American contemporary *Aviation*, the Loening Amphibian, which has been secretly under development for over a year, made its first public appearance on January 18, at Bolling Field, Washington, D.C. This ship, the first of an order of ten being built for the U.S. Army Air Service, was delivered by air, piloted by Lieut. Wendell H. Brookley, who flew the machine from the Loening factory on the East River, New York City, to Mitchel Field. From there he made the cross-country trip to Bolling Field. It was the first cross-country flight ever made by an amphibian flying boat in America. Lieut. Brookley's trip was without incident, and he reported that the new craft handled well in every way.

The following day Lieut. Brookley demonstrated the capabilities of the Loening Amphibian to the Lampert Aircraft Investigating Committee with a masterful exhibition of flying. Taking off from the field with Fred Heckert, aeronautical engineer of McCook Field, as a passenger, Brookley landed

at a moment's notice. No extra floats or other devices are used, as the new design obtains its amphibious characteristics by the shape of the main fuselage body itself, the bottom of which is shaped like a flying boat hull, while the upper portion follows the lines of the usual tractor fuselage. To this is attached a folding landing gear, an ingenious device which is operated by an electric motor—the pilot merely throwing a switch in order to raise the wheels for water landing, or to lower them for alighting on the land.

As already demonstrated in flight, the new Loening Amphibian, in performance of speed and manoeuvrability, compares favourably with other aeroplanes of the same weight equipped with Liberty motors, such as the D.H. But the deeper metal body and the unit construction give it a strength and rigidity which should greatly increase the safety of the crew in case of accident. In the sand test, conducted by the Air Service at Dayton, this body stood up without failure to a load of three or four times what is customarily applied.



THE LOENING AMPHIBIAN BIPLANE : A recent American machine of somewhat unusual design, which might be described as being midway between the orthodox tractor-fuselage biplane and the flying-boat. It is fitted with a 400 h.p. Inverted "Liberty" engine.

shortly after to show the committee the adaptability of the craft as a land plane. Taking off again, the pilot folded up the landing wheels, and sideslipped down to the Naval Air Station at Anacostia which adjoins Bolling Field.

Four landings in the water were made altogether, and then, seeing Capt. Robert Oldys of the office of the chief of Air Service idling about in the air in a De Havilland, Brookley climbed and came alongside. Both pilots then threw the throttles wide open, and came down the field wing to wing. Soon Capt. Oldys was far outdistanced and the huge amphibian had beaten the D.H., the inverted Liberty motor in the amphibian turning up 1,700 r.p.m. for a speed of 127 miles per hour.

Considerable interest is attached to this machine in aviation circles, as it represents a somewhat daring and novel design. For about the first time in the development of aeroplane design, the ordinary tractor type of biplane has been modified, so that the machine is capable of landing on either land or water, with ability to start from or alight on either,

In addition to the metal covering of the entire hull and body, the interior construction of the wings is largely metal, duralumin being the chief material used.

One of the most interesting features of the machine is the use of the Inverted Liberty Motor. This development places the bulk of the engine cylinders, etc., below the line of thrust of the propeller, so that clearance for the propeller is more readily obtained, and at the same time, the centre of gravity of the weight is lowered several feet.

The Loening Amphibian weighs 3,300 lb. empty and 4,000 lb. loaded. It has seats for a crew of three and a gas capacity of 140 gallons, sufficient for a non-stop flight of 700 miles.

Another interesting feature of the machine is that the forward projection of the boat-shaped body protects the propeller if landings have to be made in thick wheat fields or bushes, and prevents the machine from turning over on its nose, when hitting obstacles.

The new machine was designed and built by the Loening Aeronautical Engineering Corporation of New York.

Air Minister's Tour

SIR SAMUEL HOARE, Air Minister, who with Mr. Amery arrived at Port Said on March 25, left Abu Scien for Baghdad by aeroplane early in the afternoon and arrived after a pleasant and uneventful journey.

Alan Cobham to Lecture

On Tuesday, April 7, Alan J. Cobham will personally describe his flight to India and back on a D.H.50. It will be a graphic account, illustrated with lantern slides from photographs, of Sir Sefton Brancker's pioneer flight of survey for the inauguration of the Great Empire air routes

of the near future. The lecture will take place at the Aeolian Hall, New Bond Street, London, W., commencing at 8.30 p.m. Air Vice-Marshal Sir Sefton Brancker will preside. Tickets, price 8s. 6d., 5s. 9d., and 3s., may be obtained from the usual agencies.

French Air Fatality

WHILE two French military aeroplanes were carrying out aerial combat practice over Chateauroux one of the machines caught fire. The pilot, N. C. O. Trubu, jumped from the machine from a height of 1,000 ft., and was killed instantly.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

ANNUAL GENERAL MEETING

THE Annual General Meeting of the Royal Aero Club was held at 3, Clifford Street, London, W.1, on Wednesday, March 25, 1925.

Lieut.-Col. F. K. McClean, A.F.C., occupied the Chair, and was supported by about 40 Members. The Chairman made a brief report on the Club's work during the past year.

Britannia Trophy.—The Chairman announced that the Committee of the Club had awarded the Britannia Trophy for 1924 to Wing-Commander S. J. Goble and Flight-Lieut. Ivor Ewing McIntyre, in connection with their flight round Australia, April 6–May 19, 1924, on Fairey Series III Seaplane, Rolls-Royce Eagle VIII engine. Total distance, 8,568 miles in 44 days, with 90 hours' actual flying time.

Committee Ballot.—As the result of the Committee Ballot, the following Members were elected to the Committee to fill the nine vacancies:—Lieut.-Col. M. O. Darby, O.B.E.; Lieut.-Col. John D. Dunville, C.B.E.; Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S.; Wing-Commander T. O'B. Hubbard, M.C., A.F.C.; Lieut.-Col. F. K. McClean, A.F.C.; Lieut.-Col. Alec Ogilvie, C.B.E.; F. Handley Page, C.B.E.; Major S. V. Sippe, D.S.O.; T. O. M. Sopwith.

Election of President, Vice-President and Council.—The following were unanimously elected:—

President.—Brig.-Gen. The Duke of Atholl, K.T., G.C.V.O., D.S.O.

Vice-President.—The Duke of Sutherland.

Council.—The Earl of Lonsdale; Admiral of the Fleet The Earl Beatty, G.C.B., O.M., G.C.V.O., D.S.O.; The Right Hon. Lord Hugh Cecil, M.P.; The Right Hon. Lord Weir of Eastwood; The Lord Howard de Walden; The Lord Montagu of Beaulieu, K.C.I.E., C.S.I.; Admiral of the Fleet The Right Hon. Sir Edward Seymour, G.C.B., O.M., G.C.V.O.; Admiral The Hon. Sir Edmund Fremantle, G.C.B., C.M.G.; The Right Hon. Sir Samuel Hoare, Bart., C.M.G., M.P.; Air Chief-Marshal Sir Hugh M. Trenchard, Bart., G.C.B., D.S.O.; Sir David Salomons, Bart.; Sir Basil Zaharoff, C.B.E., G.C.B.; Sir Mortimer Singer, K.B.E., J.P.; Count Henry de la Vaulx; The Right Rev. Bishop Welldon; Martin Dale; Andre Michelin.

Airships.—Commander F. L. M. Boothby referred to the Resolution passed at the last Annual General Meeting in which the Club was asked to allocate its funds in fair proportion for the encouragement of aeroplanes, seaplanes and airships, and stated that during the past year nothing had been done for the "Lighter than Air" section. The Chairman explained that, as far as possible, the rules for competitions had been so framed to include the participation of airships had any been available. He promised that during the present year a special Committee should be appointed to look after the interests of the Lighter-than-Air section.

On the motion of Mr. F. Handley Page, a hearty vote of thanks was passed to the Chairman (Lieut.-Col. F. K. McClean, A.F.C.).

COMMITTEE MEETING

A MEETING of the Committee was held on Wednesday, March 18, 1925, when there were present:—Lieut.-Col. F. K. McClean, A.F.C., in the Chair; Air Vice-Marshal Sir W. S. Brancker, K.C.B.; Mr. Ernest C. Bucknall; Lieut.-Col. M. O. Darby; Group-Capt. C. F. Kilner; Lieut.-Col. M. O'Gorman, C.B.; Mr. F. Handley Page; Capt. C. B. Wilson, and the Secretary.

Election of Members.—The following New Members were elected:—

Henry George Hughes Lawrence.
Richard Brock Ferris.
Leicester John Cecil Mitchell.
Flying Officer Allan Hesketh.
Ralph Dundas Hog.
Louis de Lorient.
Pilot Officer Aubrey Noel Francombe.
Flying Officer Michael Walter Crang Ridgway.
Flying Officer Herbert Vincent Kerckhove.
Flying Officer Harry Edward Greenberry.
Sydney Edgar Devonald.

Flying Officer Leslie Hamilton.

Pilot Officer James Andrew Charles Florence.

Laurence Rupert Woods.

Flying Officer Clement Allin Pike.

Pilot Officer Thomas Henry Perry-Keene.

Sub-Committee Reports.—The reports of the following Sub-Committees were adopted: Racing Committee; Finance Committee; Joint Standing Committee of the R.Ae.C. and S.B.A.C.

Light Aeroplane Clubs.—Col. Darby reported that a further meeting of representatives of the Light Aeroplane Clubs had been held in London on March 16, when the amended financial scheme put forward by the Air Ministry had been considered, and an agreement had been arrived at as to the general policy to be adopted in replying to the Air Ministry. The following centres were represented:—London, Manchester, Newcastle-on-Tyne, and Yorkshire.

Britannia Challenge Trophy.—It was unanimously decided that the Britannia Challenge Trophy for the year 1924 be awarded to Wing-Commander S. J. Goble, D.S.O., D.S.C., and Flight-Lieut. Ivor Ewing McIntyre, A.F.C., for their flight round Australia, April 6–May 19, 1924, distance 8,568 miles in 44 days, with 90 hours' flying time, in a Fairey Series III Seaplane, Rolls-Royce Eagle VIII engine.

RACING COMMITTEE

A MEETING of the Racing Committee was held on Thursday, March 12, 1925, when there were present: Lieut.-Col. M. O. Darby, in the Chair, Lieut. Col. W. A. Bristow, Capt. R. J. Goodman Crouch, Lord Edward A. Grosvenor, Lieut.-Col. F. K. McClean, A.F.C., Capt. C. B. Wilson, Mr. Howard T. Wright, and the Secretary. In attendance: Major J. S. Buchanan, representing the Air Ministry.

The King's Cup Race.—The regulations were finally approved. The following additional prizes were reported:—

- £100 presented by Sir Charles Wakefield, Bart., to the winner of the King's Cup.
- £100 presented by Mr. Samuel Samuel, M.P., to the entrant of the aircraft placed second.
- £100 presented by the residents of Harrogate to the entrant of the aircraft which completes the whole course in the fastest time.
- £100 presented by the residents of Harrogate to the entrant of the aircraft which makes the fastest handicap time from the commencement of the race to the Harrogate control on the second day.

JOINT STANDING COMMITTEE, R.Ae.C. AND S.B.A.C.

A MEETING of the Joint Standing Committee of R.Ae.C. and S.B.A.C. was held on Wednesday, March 18, 1925, when there were present:—

Royal Aero Club: Lieut.-Col. F. K. McClean, A.F.C., in the Chair; Lieut.-Col. W. A. Bristow, Capt. C. B. Wilson.

Society of British Aircraft Constructors: T. O. M. Sopwith, Capt. H. E. P. D. Acland, Commander James Bird, Mr. C. R. Fairey.

In attendance: C. V. Allen, Secretary, S.B.A.C., and H. E. Perrin, Secretary, R.Ae.C.

The question of a Light Aeroplane Competition for 1925 was fully discussed.

CONTRIBUTION TO RACING FUND, 1925

	£	s.	d.
Sir Charles Wakefield, Bart.	500	0	0
His Highness The Maharajah of Jaipur	100	0	0
Col. A. Ogilvie	25	0	0
Sir Basil Zaharoff	10	10	0
J. H. Spottiswoode	10	10	0
Capt. C. B. Wilson, M.C.	5	5	0
A. R. Dresser	1	1	0

THE KING'S CUP

Circuit of Great Britain Handicap

(Under the Competition Rules of the Royal Aero Club) presented by

His Majesty the King.

Starting and finishing at the London Aerodrome, Hendon, on Friday and Saturday, July 3 and 4, 1925.

The King's Cup will be awarded to the entrant of the aircraft which first completes two circuits of Great Britain in a handicap race under the following conditions:—

Supplementary Regulations

1. *Date.*—The race will commence on Friday, July 3, 1925, and close on Saturday, July 4, 1925, at 10 p.m. The starting time will be announced later.

2. *Organisation.*—The race will be conducted by the Royal Aero Club under the competition rules of the Royal Aero Club.

3. *Competitors.*—The entrant and pilot or pilots must be British subjects. The entrant must be an individual and not a company. The word "competitor" includes the entrant and all persons taking part in the race except passengers.

4. *Aircraft.*—The race is open to any type of aircraft. The aircraft, including the engine or engines, must have been entirely constructed in the British Empire.

5. *Entries.*—The entry fee is £10. This fee, together with the entry form, must be received by the Royal Aero Club, 3, Clifford Street, London, W.1, not later than 5 p.m. on Friday, June 12, 1925. The entrant is responsible for the accuracy of all particulars supplied by him to the Club relating to the aircraft and engine. The officials may require the entrant at his own expense to verify these particulars after the race, and for this purpose may require part of the engine to be taken down for examination.

6. *Air Navigation Regulations.*—Competitors must comply with the Air Navigation Regulations in force, subject to any concessions which may be made by the Air Ministry for the race.

7. *Course.*—The course for each day is as follows:—

Friday, July 3, 1925

First Circuit

Starting Place.—London Aerodrome, Hendon.

Controls.—Harrogate (The Stray), 173 miles; Renfrew Aerodrome, 173 miles; Newcastle-on-Tyne (Town Moor), 124 miles; Manchester (Woodford Aerodrome), 117 miles; Bristol (Filton Aerodrome), 126 miles.

Finishing Place.—London Aerodrome, Hendon, 100 miles. Total, 813 miles.

The first circuit must be completed by 10 p.m. on Friday, July 3, 1925. Aircraft not having arrived at the London Aerodrome, Hendon, by that time will be eliminated from the race. Aircraft must not leave the aerodrome until their starting time the following day.

Saturday, July 4, 1925

Second Circuit

Starting Place.—London Aerodrome, Hendon.

Controls.—Bristol (Filton Aerodrome), 100 miles; Manchester (Woodford Aerodrome), 126 miles; Newcastle-on-Tyne (Town Moor), 117 miles; Renfrew Aerodrome, 124 miles; Harrogate (The Stray), 173 miles.

Finishing Place.—London Aerodrome, Hendon, 173 miles. Total, 813 miles.

The race will close at 10 p.m. on Saturday, July 4, 1925.

8. *Controls.*—Aircraft must make a stop of 30 mins. at each control with the exception of Renfrew, where a stop of one hour must be made.

9. *Handicap.*—The aircraft will be handicapped on a time allowance basis for the two circuits, and half of the total handicap will be allotted to each circuit. The minimum speed at which the aircraft will be handicapped will be 80 m.p.h.

Aircraft will be started from the London Aerodrome, Hendon, in accordance with the handicap allotted for the first circuit, and will be timed from the given signal to start.

Aircraft will be started from the London Aerodrome, Hendon, on the second circuit in accordance with the handicap allotted for that circuit plus or minus the time gained or lost on their handicap for the first circuit.

10. *Time Cards.*—Each pilot before starting will be supplied with a time card, on which will be entered his time of arrival and starting time from each control. Competitors are responsible for the safe custody of such card, and for its production to the official at each control, or at any time when called upon by an official.

11. *Starting (Hendon and Controls).*—The position of the starting line will depend upon the direction of the wind and will be notified to the pilots on arrival at the aerodromes.

Each pilot and his aircraft must be on the starting line 10 minutes before his official time of starting. Should any pilot fail to start within 5 minutes of being given the signal to start by the official starter, he must remove his aircraft from the starting line if and when so ordered, after which he will only be allowed to start with the sanction of the official starter. His time will be taken as from the original signal to start.

The official starter will stand to the side of the aircraft, selecting his position so that he can best be seen by the pilot.

Ten seconds before the time of starting the official starter will raise a red flag. On the raising of the red flag the pilot and passengers, if any, must be on board the aircraft and all mechanics, with the exception of one at each wing tip, must stand clear of the aircraft, and chocks, if any, must be removed. At the expiration of ten seconds the official starter will lower the red flag smartly to the ground, this being the signal to start.

Any aircraft crossing the starting line before the lowering of the red flag will be disqualified.

Competitors are solely responsible for the observance of these regulations by those in attendance on the aircraft.

12. *Arrival at Controls and Hendon.*—The time of arrival at each control and at Hendon will be taken at the moment the aircraft passes in flight between two white crosses on the aerodrome at a height of not more than 500 ft. This may be done in either direction. After passing between the two white crosses the pilot must alight immediately and report to the officials in charge and produce his time card.

A white flag displayed on the aerodrome will indicate to the pilot the place at which he must report to the officials.

In the interests of safety pilots must refrain from zooming after passing between the white crosses. They must circle left and land in the same order as arriving.

13. *Landings.*—Landings between the controls will not disqualify the aircraft, but all time spent between controls will be taken as flying time.

14. *Repairs.*—The same aircraft and engine must be used throughout the race, but repairs and replacements are allowed. Spare parts need not be carried on the aircraft.

Discarding, without immediately replacing, any part of the aircraft or engine, or making any modification to the aircraft or engine during the race, will entail disqualification.

Competitors will be responsible for any infringement of this regulation by third parties.

15. *Identification of Aircraft.*—For the purpose of identification all aircraft must carry the Government registration marks as laid down in the Air Navigation Regulations, except in the case of Service aircraft, for which special instructions will be issued.

16. *Verification of Aircraft.*—Aircraft must be at the London Aerodrome, Hendon, completely erected not later than 4 p.m. on Thursday, July 2, 1925, for verification by the officials, and must not leave the aerodrome until their starting time. Any competitor not having his aircraft ready for presentation to the officials by the specified time will render himself liable to exclusion from the race.

17. *Pilots.*—The pilot or pilots must not be changed during the race, except in the event of a special emergency, and then only at a control with the consent of the officials.

18. *Passengers.*—The same number of passengers, if any, or the equivalent weight, viz., 170 lbs. per passenger, must be carried throughout.

19. *Fuel Supplies.*—The Royal Aero Club is in no way responsible for the supply of petrol and oil, not for any delay which may arise in refilling. The competitors themselves must make their own arrangements with the supply companies, who will be given full facilities.

20. *Armlets.*—Armlets will be provided and must be worn by the pilot and all passengers accompanying him.

Additional prizes have been promised up to the present time, as enumerated above under the Racing Committee's report.

Offices: THE ROYAL AERO CLUB,
3, CLIFFORD STREET, LONDON, W.1.
H. E. PERRIN, Secretary

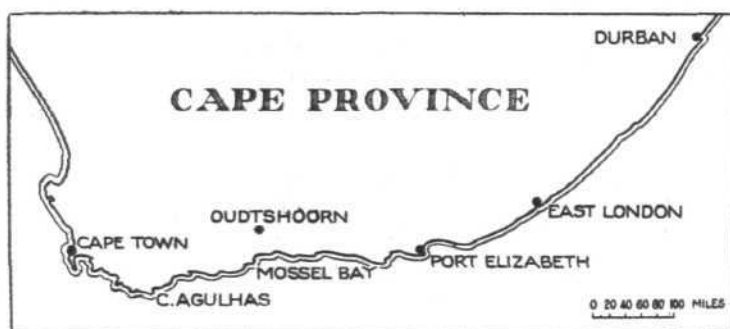
AN ARDUOUS ROUTE

Detailed Story of the New South African Air Mail Service

By J. L. CARLIN

AFTER accompanying two trial flights of the new South African air mail service and flying some 2,000 miles with the machines and pilots which are now carrying the weekly overseas and inland mails between Cape Town and Durban, I have come to the conclusion that the route must be one of the most difficult and most interesting mail routes in regular operation in the world. In the first place, as I pointed out in a previous article in *FLIGHT*, the whole 950 miles of the trip is flown along a sparsely inhabited and mountainous coastal route such as is flown by no other service of my acquaintance. Then, the sub-tropical conditions lead to very difficult weather conditions, low clouds and sea mist being more or less constant at the Cape Town end and frequent along the whole route.

What this means every one acquainted with flying will understand when I tell something of our experiences on the trial trips. It so happened that the Cape coast was in the throes of a particularly severe heat wave just as the trials were due to start. At Mossel Bay, for instance, the shade temperature taken in the official screen near the hangar was 107°, and similar figures were recorded all down the coast; the temperature of the water at Mossel Bay was about 70°, and at other places along the coast it varied between 70° and 58°. Thus the coast was at once enveloped in fog.



Sketch-Map of the route followed by the South African Air Mail.

On the first down trial trip from Durban to Cape Town with dummy mail bags everything went perfectly for nearly the whole way. At Mossel Bay the mist was encountered, but it was possible to fly low beneath it; but the Hottentots Holland mountains had to be crossed if Cape Town was to be reached overland, and they are 4,000 ft. high.

The machines therefore climbed up over the land where there was less mist, only to find higher clouds through which the peaks of this range just emerged in the far distance. With those clouds as well as the mist which we knew to be highly probable round the base of the mountains, it was, obviously, impossible to attempt to cross them at all, and that meant going round the coast round Hangklip into False Bay and then across the bay, still keeping low under the mist to the aerodrome at Wynberg, just under the eastern slopes of Table Mountain. This is what we actually did. In addition to the mist there was a choppy breeze that made such low flying very unpleasant and somewhat dangerous, for the steep gorges and kloofs of the coast broke the wind up and made the going very rough indeed. However, all landed safely at Wynberg.

For the return trip to Mossel Bay it was decided to keep high from the start. This was done, and the mountains were crossed comfortably at a height of 7,000 ft. However, a weather report had been received that there were clouds at 100 ft. over our destination, and when we had crossed the mountains there was nothing to be seen ahead but a solid sea of cloud at between 3,000 and 4,000 ft. It was most interesting from the weather point of view. The ranges here enclose deep valleys, and in some places these valleys are almost totally enclosed basins. Such valleys and basins were all full to the brim with cloud, which was pouring over their sides and through the gorges into the clear country we had just passed. Obviously, the mist was being generated very rapidly in these valleys.

That being the situation, we were forced to come down, go round the coast, and fly beneath the low clouds and mist.

For about 100 miles past Danger Point to Cape Agulhas this was done successfully, and then 8 miles east of Cape

Agulhas the fog lowered until the two machines were almost skimming the breakers, and a landing on the magnificent beach was decided upon. Thus, for the first time in history, aeroplanes landed at Struis Bay, which is next to the southernmost point of the African continent. After a wait of about three hours, the mist lifted slightly and it was possible to proceed and cut across on to the land. However, with the rising elevation, the machines again encountered the low cloud, and it was only after an hour's hedge hopping and another forced landing that they arrived at Mossel Bay, after having made 10 hours of a 3-hour journey.

The next stage to Port Elizabeth had therefore to be deferred until next day. All the morning we waited on the aerodrome at Mossel Bay for the dense mist to lift, and it was not until 11 o'clock that it was possible to make a start. The aerodrome there is a few hundred feet above sea level, and we knew that we had that much margin if we once got down to the sea. The machines therefore made a dash through the mist over a low intervening hill and at once dropped to the sea, where flying at about a hundred feet was possible. But the mist got lower and lower, and at last we were forced down to the very crests of the breakers and had to keep on following the surf, which we could just see some twenty feet below the wheels. This course led the machine in which I was flying into a particularly dangerous situation, from which we were only saved by great skill and good luck. The breakers curved towards the shore, which was invisible, and we followed the curve. Suddenly a dark mass loomed up out of the whiteness, and my pilot turned slightly to avoid it, only for another similar mass to rise immediately on the other side. He realised at once that the surf had led him into one of the narrow and steep-sided river mouths that abound on this coast, and he immediately zoomed. Fortunately all went well, and we rose out of the ravine into the blue sky. For, although the pilot did not know it, the mist was very thin, and, looking back as we rose, the crest of the hills bordering the river mouth could be seen and the ravine was filled with thick mist through which we had come. The whole country inland was clear.

But those were only trial trips which were undertaken as much for the purpose of trying out the pilots as the machines. Most of the men had no knowledge of the Cape and its peculiar weather. I am writing just as the third actual mail trip has been successfully completed in the face of really difficult flying weather. The first trip only was blessed by a following wind, and even then the Cape Town end of the route gave a great deal of trouble. Mossel Bay aerodrome had to be washed out and Oudtshoorn substituted after the last trial, for the fog persisted and one of the pilots, forced to land in the fog, crashed his machine, fortunately without injury to himself.

That first mail trip caught the post office and the critics napping. The 'planes, urged on by the following wind, were some two hours ahead of schedule, and, in fact, ran right up to the posting times at the various stops. One newspaper man, who flew the first trial, condemned the scheme because the 'planes were an hour late and would have missed the mail boat. He has since been forced to eat his words.

The second actual trip was almost equally successful, except that even worse weather was experienced on the Cape Town end. To get to the Oudtshoorn aerodrome from Port Elizabeth it is necessary to cross the Outeniqua mountains, which are some 4,000 ft. high. The clouds were lower than their summits, and the airmen were forced to wind their way between the gorges and kloofs in order to cross the range. However they arrived all right and caught the mail boat with an hour to spare.

The third trip, which is the last up to the time of mailing this article, was flown under the worst weather conditions that have so far been experienced. The 'planes left Cape Town soon after the arrival of the mail boat, actually leaving the ground at 7.40. They at once struck strong head winds and heavy cloud. The wind was so strong that one machine which was not carrying mails, the load being a small one, decided to turn back to Cape Town rather than take risks unnecessarily. The other pilot climbed to 14,000 ft. in an attempt to get over the clouds, but failed to do so even at that height, and had to come down and go a long way back to find a way underneath. In the end he arrived safely at Oudtshoorn after having flown for 4½ hours. The air line distance is about 220 miles, and he should have made it in

2½ hours. According to the pilot it was a really terrible journey. But the mails got through.

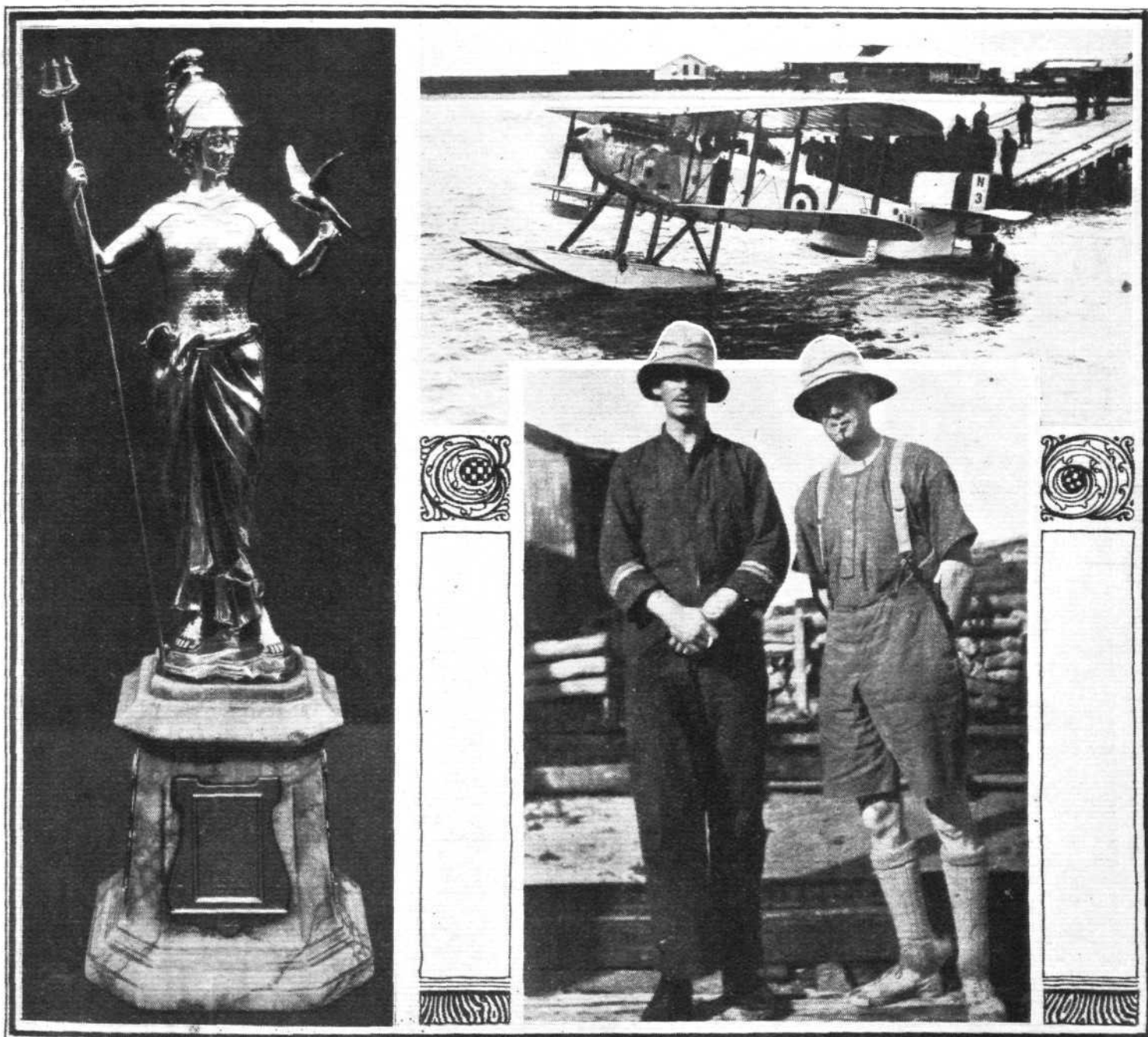
By dint of heroic perseverance the pilots got to East London before dark the same day, but had to remain there for the night. Next morning the whole coast was steeped in unusually severe rains. In one place not far from the air-mail route 14 in. fell in 24 hours, while there was a bad washaway on the railway. It was almost impossible to proceed, but the two East London pilots made a gallant effort, only to be forced to return by the rain and low-lying clouds. Later in the day one plane carrying all the mails—fortunately a small load—started off and managed to get through to Durban at 3.15 in the afternoon after flying practically the whole distance—300 miles—at a height of 100 ft. over the sea, through what the pilot called "ghastly weather." Even then the mails were in Durban 20 hours before the ordinary mail train was due.

The quality of the Union's airmen is such that the mails will get through every time if human effort can do it. The greatest resentment was aroused here by a tactless and irresponsible statement that appeared in an English aviation paper in the very week that the present air-mail was due to start. This paragraph, seemingly so carefully timed to produce the greatest hurt, is entirely incorrect, while the terms in which it was couched should have made it suspect to any responsible editor.

But to return to the air-mail. It should be made clear that in view of the uncertain and difficult conditions at Cape Town the winter time table, which was framed to suit the shortening hours of daylight, has been put into force. According to this time table the journey is now done in two days down the coast to ensure catching the steamer, but if the planes on the up trip arrive at East London so that a clear four hours before sunset is left for the flight to Durban, the up trip will be carried through in one day according to the summer schedule.

The mail for England now leaves Durban on Thursday afternoon at the latest, which will ensure a daylight run to East London, and next day the machines proceed at dawn on the next stage.

No account of this new service could close without reference to the magnificent showing of the Siddeley Puma engines fitted to the war-time D.H. 9's, with which the service is being run. These engines have given practically no trouble whatever, and there has not been one failure in the air so far. Once there was a little carburettor trouble; twice there has been an unimportant leak in the water system; in ten machines the only serious repair has been the replacement of one cylinder block. If the pilots had not the greatest faith in engines and machines running, the service would be a very different proposition.



THE BRITANNIA TROPHY: The Royal Aero Club have awarded the Britannia Trophy for the best flight of 1924 to Wing-Commander Goble and Flight-Lieut. Ivor E. McIntyre for their magnificent flight round Australia last summer on a Fairey III D seaplane fitted with a Rolls-Royce "Eagle" engine. *Left:* The Britannia Trophy. *Bottom, right:* Wing-Commander Goble (*right*) and Flight-Lieut. Ivor E. McIntyre; *Top:* The Rolls-Royce Fairey III D machine.

MODERN ZEPPELIN AIRSHIPS

Not only because of the interest at present being taken in airship questions in this country, but also on account of the manner in which the lecturer dealt with his subject, the paper read by Herr Dr. Hugo Eckener, of the Zeppelin Company before the Royal Aeronautical Society on March 26, was, perhaps, one of the most instructive which the members of that society have listened to for a very long time. Lieut.-Col. Tizard was in the chair. In his introduction the distinguished lecturer, who, it will be remembered, piloted the Z.R. III to America recently, referred to the old controversy: Airship *versus* aeroplane, and pointed out that the great strides made in the development of the latter had by no means resulted in the ousting of the former, but that the two have developed side by side, and that the airship has certain qualities which in some respects give it a superiority over the aeroplane. It could cover much greater distances; it could reduce its speed to *nil* and still remain in the air; it could travel and land in fogs, snowstorms and at night much more securely than the aeroplane; and his personal opinion was that it was much easier to keep the airship aloft in stormy weather than was the case with the aeroplane.

Dr. Eckener then gave a brief outline of the evolution of the Zeppelin airship up to the present, from which we quote the following:—

"This evolution revolves in the main around two points: Firstly, speed; and, secondly, relative carrying power. Relative carrying power means, of course, the commercial carrying capacity by percentage with a given size of the ship, and provided that the ships are of an equal stability. As for the development of the speed which enabled the airships to conquer strong winds and even storms, you are no doubt familiar with the decisive part that the development of the motor has played in this respect. Suffice it to point to the fact that Count Zeppelin had in his first airship, in 1900, a motor of 15 h.p., which weighed 480 kg.; that in his second airship, in 1905, he had a motor of 80 h.p., also weighing 480 kg.; and that the last motors during the War were 260 h.p. with almost exactly the same weight."

The lecturer then referred briefly to the improvement in shape which took place, and which changed the airship hull from the plain cylinder with rounded ends and multi-rudder control organs to the streamline form of the modern airship, with cantilever monoplane tail surfaces. How this improvement in form assisted in an increase in speed was told by the lecturer as follows:—

"The speed attained by those types (*i.e.*, the earlier airships) up to the time of the beginning of the War amounted at the most to about 18 m.s. (40 m.h.), and the relative commercial carrying lift was about 25 per cent. of the total lift. When you consider that the Z.R. III has a speed of 36 m.s. (80 m.h.) with a useful lift of 56 per cent. of the total lift, the immense progress made since those Zeppelin pioneers is evident. This progress is even more clearly demonstrated by the fact that Z.R. III, a ship of 70,000 cubic m., with an engine capacity of only 400 h.p., would have the same speed as the last pre-War airship of 18,000 cubic m., with 500 h.p., namely, 18 m.s., and that under this hypothesis its relative capacity would be 65 per cent., as against 25 per cent. of the last pre-War ship."

The earlier ships were too slow (about 40 m.p.h.) for regular air traffic, but the lecturer pointed out that the five pre-War airships built for carrying passengers made altogether something like 2,000 flights and carried a total of 42,000 occupants without a single mishap to a passenger. This, it should be remembered, was before the War.

Concerning the increase in size, the lecturer said:—

"The systematic development of the Zeppelin airship, along more scientific lines, with a view to attaining the greatest possible capabilities, began shortly before the outbreak of the War and proceeded during the War with amazing rapidity. Since in the enlargement of the ship's size the required construction weights do not increase in the same measure as the contents, it is obvious that building larger ships offered the chance for an increase of its capabilities. Taking account of the military requirements for greater speed and greater ascending power to a maximum height, the size quickly grew from a good 20,000 cubic m. at the beginning of the War to a 32,000 and 36,000 cubic m. in 1915, to 56,000 cubic m. in 1916, and, finally, to almost 70,000 cubic m. in 1918. Meanwhile, there ran parallel with this development of speed an improvement of the shape which became more and more feasible with the increasing size. This improvement affected not only the ship's body itself, but primarily also the gondolas

as well as the ship's entire organism. At the same time the constructors also were busily engaged in the work of removing or reducing all incidental resistance. Thus was gradually developed the so-called streamline form—a compact, smooth, cigar-shaped bag, in the construction of which special pains were taken to avoid as much as possible all outstanding wirework or other impeding objects protruding from the surface of the vessel.

"While the improvements I have spoken of benefited primarily the speed of the airship, the engineers continued their unceasing efforts to reduce the weight of the ship's body itself, and thus to increase the useful lift. This they accomplished by perfecting the basic mathematical figuration of the ship's framework, utilising in this work the innumerable wartime experiences and lessons with regard to safety and intactness with a minimum of material. The airship was forced to keep pace in this respect with the airplane.

"What was the result of all these efforts and improvements?

"The military airships at the beginning of the War had, with a size of about 22,000 cubic m. and with three motors of a total capacity of 630 h.p., a speed of 18 m.s.; they had, with a weight of 3,000 kg., an ascending power up to about 2,000 to 2,500, according to the temperature conditions.

"In 1915 there was created a type of 32,000 cubic m., with four motors of altogether 960 h.p. It attained a speed of 25 m.s. and an ascending power up to 3,000 to 3,200 m. with a weight of 3,000 kg. This type was later made longer and brought up to a size of 36,000 cubic m., whereby the ascending power grew by 300 m. without the speed being noticeably reduced.

"But the rapid development of the airplane made it necessary, even in 1916, to bring out a considerably larger and more capable type of airship. It was a vessel of 56,000 cubic m. contents with six motors, and which had 28.5 m. speed, and an ascending power to about 4,000 m. with 7,000 kg. weight. However, this ship came out at a time when the phosphorus igniting missiles for the defence against airships had been introduced, which made the use of this type impossible. A greater ascending power had to be attained. The weight reduction required for this was reached by building out one of the motors and other important alterations in the construction, especially as regards the machine, the engine gondolas, and the transference of power. These alterations in construction were also designed to reduce the incidental resistance. The reconstruction showed the really astonishing result that the speed was increased from 28.5 m. to 31 m. per second, and that at the same time the maximum ascending power was gradually increased from 4,000 m. to 5,500 m. with 7,000 kg. of load. The useful lift had been increased from 45 per cent. to 65 per cent. of the total lift. This type represented in point of construction probably the best attained during the War. An increase of the size to 68,000 cubic m. through the addition of two gas compartments, with equal diameter and with a simultaneous increase of the number of motors to seven, brought no essential improvement. Improvements worth while were not attained until after the War, especially with the Z.R. III., which I shall discuss later."

A series of lantern slides was then shown, illustrating the points dealt with by Dr. Eckener in the preceding paragraphs of his paper. Turning to the post-War experience of the Zeppelin Company, Dr. Eckener said:—

"Only three airships were built after the War—the Bodensee, the Nordstern, and Z.R. III. The first two had been designed for traffic between Berlin and Friedrichshafen, but only the Bodensee was actually used in this traffic from the end of August until December, 1919, because these trips had to be discontinued by order of the Ambassadors' Conference. The results of the trial service had been extraordinarily satisfactory. The trips could be carried out in almost any kind of weather, and no mishap occurred unless an emergency landing in the open field during a heavy snowstorm is to be characterised as such—a landing which, by the way, caused no damage to either passengers or ship. The Bodensee was always occupied to its capacity, and it made altogether 103 trips, on which it carried a total of 2,450 passengers.

"The Bodensee had a gas capacity of only 20,000 cubic m., and was equipped with four engines of 260 h.p. each, which gave the ship a speed of 36.3 m.s. It had a useful lift of 9,600 kg., or 42 per cent. of the total lift. If you compare this with the last passenger airship before the War which, with the same cubic capacity, had a useful lift of only 6,500 kg.

—that is, 30 per cent. of the total lift—and a speed of only 18 m.s., then you will realise the tremendous headway recorded in the meantime.”

Dr. Eckener referred to the change in fineness ratio incorporated in the “Bodensee,” which was considerably more plump than the older airships, and he said that the small ratio of length to diameter chosen was only decided upon after wind-tunnel tests had shown that such a proportion could be stabilised without too large tail surfaces. He stated, however, that their experience with the “Bodensee” led them to the conclusion that it was not advisable to reduce the proportion of length to diameter too much, especially with larger ships. Consequently, somewhat less extreme proportions were chosen in building the Z.R.III. Some interesting particulars were then given relating to the wind channel used by the Zeppelin Company at Friedrichshafen. This measures 2.9 m. (9 ft. 6 ins.) in diameter, and wind speeds up to 50 m. per second (111½ m.p.h.) can be attained. In spite of the great value of this wind tunnel, the lecturer expressed the opinion that a complete transference of the channel results to the full-size airship would scarcely ever be possible without a great number of measurements and experiments with the airship in action.

Concerning the Z.R.III Dr. Eckener said:—

“The decree of the Ambassadors’ Conference had fixed the cubic capacity at 70,000 cub. m. The length of the ship is 200 m., the proportion of diameter to length is about 1:7.3; it is somewhat more slender than the ‘Bodensee,’ but not quite as slender as the 56,000 cub. m. type used during the War. It has an outright streamline shape, without cylindrical centre-piece. The course stability of the ship is a very good one, particularly as a result of the excellent efficacy of the fins. Trials in the wind channel had shown that the fins are most efficacious when they are placed at a certain distance from the stern, and our experiences with Z.R.III confirmed this. As a consequence the size of the fins could be reduced, which, together with their more favourable location, with regard to the strain on the ship, is equally advantageous, probably particularly so for ships fastened to a mooring mast.

“As for the details of the Z.R.III, I shall confine myself to a few characteristic facts, since the ship as a whole is, no doubt, pretty well known to all those interested. The Z.R.III shows a novel construction of the corridor, which deviates somewhat from the circle of the cross-section of the ship’s body without, however, thereby reverting to the type of outer corridor, in contrast to the inner one used during the last few years.

“Furthermore, the ship was equipped with a new type of engines, namely, 400 h.p. Maybach motors, which have ball bearings instead of the former bearings, and which can be started and reversed by compressed air.

“The speed of the Z.R.III is 35.3 m.s., its carrying capacity 46,000 kgs.—that is, 56 per cent. of the total lift. Although the ship does not in point of size, speed, and lift exceed the last War-time types of airship to a considerable degree, it still represents an appreciable measure of progress. For the stability of the ship as a whole has been greatly increased by improved adjustment and dimensioning of the girders, and the coefficient of safety in the individual parts of the ship has been greatly equalised. The vibrations in the framework have been reduced to a minimum, in a manner which is really surprising to every one who knows the last War-time ships. The reason for this progress is to be found in a thoroughgoing improvement and a more exacting form of the static method of calculation.”

On the question of actual flying of airships Dr. Eckener said that gales were regarded by the layman as dangerous to airships, but that, as a matter of fact, a strong wind would never have other effect than to delay or speed-up the trip of an airship, and that it was the vertical air currents that were of more importance, sending the airship upwards rapidly and necessitating the valving of gas, or dropping it dangerously close to the ground. A modern airship was, at least, as capable of flying in rough weather as an aeroplane, and on one of the trial trips of the Z.R.III the weather became so rough that an aeroplane which was accompanying the airship had to land. If care was taken to see that the airship was always properly trimmed as the amount of fuel carried was lessened by consumption there was no danger, and the ship could be kept under control in rough weather. The lecturer considered that an airship pilot should have a certain amount of meteorological training. Referring to the necessity for employing technical means of keeping the airship from getting constantly lighter as fuel is consumed, the lecturer expressed preference for the water-recovery method. As regards the danger of lightning, Dr. Eckener thought that provided the valves and ballonettes were gas-tight and the

valves were not used actually in a thunderstorm, there was little danger. “In most cases,” the lecturer continued, “the airship can circumvent such atmospheric disturbances. As a matter of fact, however, I am convinced that, in order to remove the last vestige of danger in connection with the use of hydrogen, we must and will come to a combination of hydrogen and helium. Then we shall emit hydrogen only when it is absolutely safe, and when we can thereby save the expensive helium.”

“I have discussed the imaginary and actual dangers at considerable length because of their basic importance, though I may add that they did not cause us over much worry or difficulty during the transatlantic trip of the Z.R. III. We were certain that we would be equal to them. However, we were obliged, in the interest of propaganda for airships, to ‘put over’ our flight in good style, that is, in the briefest possible time, and it is from this viewpoint that I entertained some doubts and concern only with regard to the sufficiency of our fuel supply. I calculated that in all probability we could take along about 30 tons of fuel, provided that we limited crew and ballast to a minimum. This amount of fuel would suffice for about 70 operating hours, if we let all five 400 h.p. engines run full speed. Thus we would have covered about 8,700 km. (4,650 nautical miles) in wind-stillness. But if one counted upon an average of 6 to 7 m.s. of counter-wind—which is not too high an estimate in the Atlantic in the fall—we would have covered with our 30 tons benzine only about 7,300 km. But the route *via* the Azores, which we had chosen in view of the advanced season, is 7,500 km. Thus it was clear that we must at any rate travel with reduced speed, that is, with 300 h.p. to each engine instead of 400 h.p. In this manner we could last 96 hours with 30 tons of benzine and cover 8,600 km, with 6 to 7 m.s. counter-wind, that is, we could make the 7,500 km. in approximately 83 hours. I was a bit concerned over the question whether the 30 tons of benzine would really bring us to the Atlantic coast. For we had to travel over some medium mountains in France at a height of about 850 m.; we had to figure upon possible high temperatures in the noon hour, and, finally, we had to anticipate a considerable cooling of the gas toward evening from 6 to 8 degrees. All this was likely to give our ship an overweight of from 9 to 10 tons towards evening. The dynamic lift of the Z.R. III, it is true, amounts to 8 to 9 tons with 6 degrees elevation and 31 m.s. speed, but one does not like to take such a heavy ship out into the sea at night. As soon as only one engine failed even temporarily, we would have had to throw off ballast and benzine. Fortunately, thanks to the aluminium coat of the outer cover, the gas-overheat was only 2 degrees, and thus we had at any rate gained an amount of approximately 1½ tons as against our calculation.

“The ship ascended in Friedrichshafen in dense fog, in a temperature of 10° C., 400 m. above the sea level, carrying a useful lift of roundly 39 tons, of which 30 tons were benzine, 2 tons oil and 1½ tons water ballast. During the first half of the flight the weather was favourable; over the Azores and over the European Continent there lay a high, and in between a zone with a small disturbance, an outgrowth of a low in the north. Likewise, between Newfoundland and the Bermudas in the Gulf Stream region, there seemed to develop a disturbance of originally indeterminable scope. On our trip across France we had fine weather, with a light south-easterly wind, and made progress with a speed of 105 km. per hour. We crossed the summits of the Cote d’Or as low as possible at a height of only 50 m., and in this way, although over the Cote d’Or, we had a temperature of 21° C., we succeeded in reaching the Atlantic coast with a ship that weighed only 5 tons. This load we could well drag through dynamically, especially inasmuch as we reduced it hourly by 310 kg. by benzine consumption. Towards 7 o’clock in the evening we ran into the afore-mentioned little disturbance; it brought us from 10 to 12 m.s. wind with rain squalls. Under the steep coast of Spain, at Cape Ortegal, the growing wind made itself noticeable in the shape of strong falling gusts which at times caused a more violent yawing and stamping of the ship. An old experience; over land the air turbulence is greater than over the open sea. Toward midnight we had run through the atmospheric disturbance, the wind having changed from south over west to north-west, and now followed a stretch of finest weather until the next evening about 10 o’clock; a clear sky and from 2 to 3 m.s. of wind, at first north-easterly, then from a southerly direction.

“The navigation was governed by drifting measurements by means of piling bombs, which we dropped, according to necessity, every two to four hours. Navigation was somewhat difficult and unsteady during the first part of the night, since the wind changed abruptly both in direction and force, and the next morning we stood about 1° more to the south

than we had assumed; this we established by inquiry from a passing British steamer. The second evening the weather became worse. The wind came with increased velocity from the south-west, and toward midnight had reached a strength of from 12 to 14 m.s., so that we made headway only at a rate of 60 to 70 kms. over the ground. It was obvious that to the north-west of us there lay a considerable depression. But for a long time we could determine nothing accurate about its scope and location, since we were just then along the border of the Gulf Stream, and strong aero-electrical vibrations prevented communication with the radio stations. At last, in the early hours of the following morning, we had a clear and distinct report from the cruiser *Detroit*, which was situated 45 west 45 north, that she was having a south-easterly wind 7 force, and also a message from the cruiser *Milwaukee*, situated about 300 miles to the south-west of the *Detroit*, that she was having a south-easterly wind force 6 to 7. Now, we knew that the centre of the depression must be somewhere between the two cruisers, a bit more to the west, and that it was possible to travel around this centre of the depression, and that we should meet an easterly wind over the Newfoundland banks. We were fully aware that in doing this we should probably run into very heavy weather, but we were certain that we should be able to master it. We therefore took a north-westerly course, and already after six or seven hours we ran into a windstill zone, while two hours later—toward one o'clock noon—we got a fresh south-easterly wind, with which we steered a westerly course toward Sable Island. For several hours we travelled over the fog of Newfoundland bank, at a height of from 1,500 to 2,000 m., and the ship was riding quite calmly and steadily although there was a stiff north-easterly wind. When, at 7 o'clock in the evening, we descended in order to determine the direction and velocity of the wind below the fog by means of piling bombs in the water, we saw that a storm of about 25 m.s. was blowing over the sea's surface. A few hours previously, on the frontal side of the depression, we had had a temperature of 24° C.; now, in the rear of the depression, we had only 5° C. This great contrast in temperature explained the violence of the storm, of course. The air was extraordinarily turbulent over the water, imposing a heavy strain upon the ship. But, with the exception of a single broken cross-wire, the ship suffered no damage whatsoever. After two or three hours we were clear of the worst weather, and now proceeded in a calm, rapid flight to New York, where we arrived at 7 o'clock in the morning.

"The trip across the ocean, from the mouth of the Gironde to Sandy Hook, had lasted exactly 70 hours."

In the commercial use of airships Dr. Eckener said there were three main points to be considered: speed, safety and rentability, or, as we should call it, profitability. For the first, taking as an illustration the voyage across the Atlantic between Europe and North America, the lecturer said it was quite certain that with airships that could be built at present the trip to America could be made in an average time of 60 to 65 hours from coast to coast, and from America to Europe in from 45 to 50 hours. On occasion the outward trip from Europe might take as long as 90 hours, but, conversely, the homeward trip might on occasion be shortened to 35 hours. As regards safety, the lecturer thought that already a reasonable measure had been attained, but he stated that the last vestige of risk must be eliminated by rendering hydrogen entirely harmless by partial use of helium, and by substituting crude oil for petrol. Concerning the mooring mast, Dr. Eckener expressed the view that, although this will doubtless prove extremely useful, it did not offer the simplest solution, which he regarded as being that of placing sheds in locations meteorologically suitable.

The lecturer pointed out the difficulty of estimating the profit-earning capabilities of airships, but on a basis of earlier experience with older ships an estimate had been prepared, which we give below:—

"Assuming that during the entire year only 100 trips are made—50 each way—the single voyage would cost approximately 200,000s. (£10,000), including all writing-off, insurance, etc. As against this cost, there would be the revenue from an average of 15 tons of paying load on each trip. These 15 tons of useful lift could be distributed as follows: 5 tons for 30 passengers, with a given weight for free luggage, food, etc. Each passenger would pay £125, making a total of 75,000s. (£3,750); 5 tons for letter mail, each 20 grammes paying 9d., that is approximately triple rate, which does not seem too high, considering the saving in time. That makes a total for mails of approximately 167,000s. (£8,350). The last 5 tons would be for baggage transportation, parcels post, newspapers and such like, all of which would pay the same rate as passengers, namely,

15s. pro kilogramme. This would bring an additional 75,000s. (£3,750). Thus the grand total of revenue would be £15,850, as against £10,000 expenses on each trip. I might add that £125 per passenger seems a very low price. As soon as the feeling of safety has taken hold of the general public there will be a wild scramble for the 30 seats, and the price per seat can be considerably increased. Furthermore, I believe that the traffic in urgent parcels post will be so great that the 5 tons of lift reserved for that purpose would not suffice."

"The revenue-surplus of each trip, that is £5,850, would make £585,000 for the 100 trips during the year. The total investment capital required for the traffic as outlined amounts to £1,750,000—if one puts the figure very high. The interest would therefore amount to 34 per cent."

"I might point out that these calculations do not include the possible and probable saving that will accrue from the use of mooring masts, nor do they include incidental revenues growing out of paid visits to hangars, leases, advertising contracts, etc.—all of which may bring in tidy additional sums of money."

"I believe, therefore—and this sums up my remarks—that the question of the feasibility of airship traffic should be viewed most particularly from the standpoint of good business, and I am glad to find that there is an impetus in that direction here in England. But I do not want to fail to emphasise also that airship traffic is a matter of international collaboration, and I take pleasure in expressing the hope, therefore, that the airship may become a means of bringing the nations of the world closer together in harmonious co-operation."

The Discussion.

The Chairman, Lieut.-Col. Tizard, said three points in the paper had impressed him: What fun the trip to America in the "Z.R. III" must have been, how solid and strong the airship structure looked, and how the slides had confirmed an opinion he had long held, that if a thing was good it was beautiful. He referred to the lecturer's remarks that he was speaking to experts. This, the Chairman said, was not the case, and we in England could not be regarded as airship experts.

Sir Alan Anderson, the well-known ship owner, said the history of the Zeppelin works was one of courage and faith. He also referred to the War period, and said that we and the Germans had been good enemies, and expressed the hope that all that would be forgotten, and that we should become equally good friends. He referred to the loss, with "R. 38," of most of our airship experts, and hoped our Government was keeping in close touch with the Zeppelin Company. As a marine nation we had, he thought, much to hope from airships. With reference to the lecturer's balance sheet, he thought the fares given were much too low. The saving in time which the airship could effect over long distances was worth much more. He had been a ship owner for the best part of his life, and in spite of the fact that he ran steamships to Australia it was 20 years since he had paid a visit to Australia. If there was an airship service he would go every year, and the trip would be cheap at £500.

Air Vice-Marshal Sir Sefton Brancker, Director of Civil Aviation, said he was by no means an expert on airship questions, but had come that evening thirsting for information. He could assure those present that the Government was determined to go ahead with airships, and he would like to ask a few questions. On the subject of lightning, for instance, how would the airship be situated? He had known of a case where an aeroplane was struck by lightning. The pilot was dazed for a few seconds, but no serious effect resulted. On the question of helium, the lecturer had mentioned the use of that gas in conjunction with hydrogen. How was it proposed to use it? As an inert gas surrounding the hydrogen-filled gas bags or how? He would also like to ask if provided Dr. Eckener had to design an airship for flying to India what size would he choose and what speed could be obtained? What was likely to be the effect of tropical climates on airships. In view of the very hot days, the cold nights, and the prevalence of hailstorms. Perhaps Dr. Eckener would give some information relating to the flight, during the War, of a German airship to German East Africa and back. He would also like to know whether Dr. Eckener would favour the carrying of a meteorological officer as part of the regular crew. In conclusion he paid a tribute to the late Count Zeppelin, and said that during the War the Count did more than anyone else to educate the British public, and his invention now promised to do more in the future in a different way.

Major Scott, Britain's foremost airship pilot, said his experiences agreed almost completely with the views expressed

by Dr. Eckener. He could not, however, agree that the trip to America by "R. 34" was more meritorious than that of the "Z.R. III," for although the latter was a better ship, her journey was considerably longer. He would like to know whether celestial observation was employed on the flight in order to supplement terrestrial navigation. He agreed with the lecturer in the utility of meteorological information and knowledge, and said that ample warning of bad weather would enable an airship pilot to go around the storm area, and might even enable him to make use of the depression to help him along.

Col. Richmond wanted to know the reasons for the statement that the low fineness ratio of the "Bodensee" could not advantageously be used in larger airships, as this did not quite tally with our experience. In view of the difficulty experienced by the lecturer in following the technical points raised in a language with which he is not very familiar,

the suggestion was made by the Chairman that these questions should be replied to by Dr. Eckener in writing. The lecturer, however, replied to certain general questions, and mentioned that the largest airship which the Zeppelin Company would care to construct without further practical experience would be of about 150,000 cub. m. (5,300,000 cub. ft.). In reply to General Brancker's question regarding the use of helium, the hydrogen cells must be surrounded by helium cells.

After the lecture given by Dr. Eckener before the Royal Aeronautical Society, the Master of Sempill gave a dinner party for Dr. Eckener. The following were present:—Sir Alan Anderson, Air Vice-Marshal Sir Sefton Brancker, Engineer Vice-Admiral Sir Robert Dixon, Sir Eustace Tennyson D'Eyncourt, Group-Captain Fellowes, Rear-Admiral C. T. M. Fuller, Lieut.-Col. Lockwood Marsh, Air Vice-Marshal Sir Geoffrey Salmond, and Lieut.-Col. Tizard.

THE ROYAL AIR FORCE

London Gazette, March 24, 1925

General Duties Branch

The follg. are granted permanent commissions as Pilot Officers, with effect from dates indicated, and with seniority of dates indicated in brackets: H. M. Whittle; March 15 (Sept. 15, 1923). J. H. C. Wake; March 17 (Sept. 17, 1923). Flying Officer R. F. Browne, D.F.C. (since relinquished his commission), takes rank and precedence as if his appointment as Flying Officer bore date Aug. 1, 1919, immediately below the name of Flying Officer D. R. Mitchell, M.B.E., on the gradation list. Reduction to take effect from Feb. 12, 1925. Flight Lieut. T. H. McDowell is cashiered by sentence of Field General Court-martial; Jan. 16.

Reserve of Air Force Officers

Flying Officer J. H. C. Wake resigns his commission; March 17.

London Gazette, March 27, 1925

General Duties Branch

The following are granted short service commns. as Pilot Offrs. on probation with effect from, and with sny. of, March 14:—W. H. O. Rumpfitt, J. H. Barringer, J. S. Blomfield, E. E. Fallick, A. R. Feather, J. C. McE. Gibb, D. W. Gibbon, F. W. Giveen, C. Heard-White, G. N. Hoar, J. W. M. Nancarrow, V. T. Norwood, A. L. R. Page, L. T. Pankhurst, S. C. Parker, C. H. Roberts (Lieut., R.A.R.O., Argyll and Sutherland Hrs.), E. G. H. Russell-Stracey, F. Sisson, R. C. W. Smyth, W. R. J. Spittle, W. L. Spurway, C.

Taite, F. B. Tomkins, C. J. Veevers, D. S. E. Vines, P. V. Williams. The following Lieuts. are granted temp. commns. as Flying Offrs. on sec. for four years' duty with R.A.F. (March 14):—C. D. Woodyatt (Northants R.), M. Kortwright (Suff. R.). Pilot Offr. G. Terrell is promoted to rank of Flying Offr. (July 27, 1924); Flying Offr. D. E. Shaw is placed on retd. list (March 25).

The following are transferred to Reserve, Class A:—Flying Offr. O. D. Freeman (March 22); Flying Offr. E. M. Milling (March 24); Pilot Offr. E. V. H. Jarvis (March 25). Flying Offr. E. Cuthbert relinquishes his short service commn. on acct. of ill-health, and is permitted to retain his rank (March 25); Flight-Lieut. A. L. Neale, M.C., resigns his perm. commn. (March 25). The following resign their short service commns.:—Pilot Offr. A. E. St. G. Gratte (March 18); Pilot Offr. on probation R. D. Kerans (March 25).

Stores Branch

Flying Offr. L. N. Sargent is granted a perm. commn. in ranks stated (March 25).

Medical Branch

Flight-Lieut. J. C. Johnson relinquishes his temp. commn. on ceasing to be empld. (March 4).

Reserve of Air Force Officers

A. R. J. Savage is granted a commn. in Class B.B., Gen. Duties Branch as a Pilot Offr. on probation (March 24).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Flight Lieutenants: D. W. Grinnell-Milne, M.C. D.F.C., to No. 19 Sqdn., Duxford; 20.3.25. W. H. Markham, to No. 9 Sqdn., Manston; 23.3.25. W. N. Plenderleith, to Aeroplane and Armament Experimental Estab. (No. 15 Sqdn.), Martlesham Heath; 31.3.25. A. W. Mylne, to H.Q., India; 14.2.25. E. B. Grenfell, A.F.C., to No. 9 Sqdn., Manston; 30.3.25. H. W. Evens, to R.A.F. Base, Malta; 7.3.25.

Flying Officers: M. Kortwright and C. D. Woodyatt, to No. 5 Flying Training Sch., Sealand, on appointment to Temporary Commns., on being seconded from the Army; 14.3.25. M. M. Freehill, D.F.C., to R.A.F. Depot (Non-effective Pool); 19.3.25. F. Barnshaw, to Inland Area Aircraft Depot, Henlow; 9.3.25. P. J. Bett, to R.A.F. Depot, on transfer to Home Estab.; 2.3.25. E. K. Clifford, to R.A.F. Depot, on transfer to Home Estab.; 12.3.25. Hon. Flight-Lieut. L. F. Marson, M.C., to Sch. of Army Co-operation, Old Sarum; 22.3.25. R. W. Pilling and Hon. Flight-Lieut. E. H. D. Spence, to Aircraft Depot, India; 5.2.25. J. F. Mehigan, to Sch. of Photography, Farnborough; 6.4.25. H. C. E. C. P. Dalrymple, to No. 2 Sqdn., Manston; 31.3.25. T. Fetherstonhaugh, to Sch. of Army Co-operation, No. 16 Sqdn., Old Sarum; 31.3.25.

Pilot Officers: W. H. O. Rumpfitt, J. H. Barringer, J. S. Blomfield, E. E. Fallick, A. R. Feather, J. C. McE. Gibb, D. W. Gibbon, F. W. Giveen, C.

Heard-White, G. N. Hoar, J. W. M. Nancarrow, V. T. Norwood, A. L. R. Page, L. T. Pankhurst, S. C. Parker, C. H. Roberts, E. G. H. Russell-Stracey, F. Sisson, R. C. W. Smyth, W. R. J. Spittle, W. L. Spurway, C. Taite, F. B. Tomkins, C. J. Veevers, D. S. E. Vines, P. V. Williams; all posted to No. 5 Flying Training Sch., Sealand, on appointment to Short Service Commns., on probation; 14.3.25. F. E. R. Dixon, M.C., to Aircraft Depot, India; 5.2.25. J. C. Don, to No. 24 Sqdn., Kenley; 1.4.25. G. H. Loughnan, to Sch. of Army Co-operation (No. 16 Sqdn.), Old Sarum; 31.3.25.

Stores Branch

Squadron Leaders: E. W. Havers, to No. 7 Group H.Q., Andover; 26.3.25. J. A. Stone, to Inland Area Aircraft Depot, Henlow; 26.3.25.

Flying Officer S. D. Dennis, to H.M.S. "Argus"; 7.4.25.

Accountant Branch

Flight-Lieutenant (Act. W./Cdr.) L. J. Lightfoot, O.B.E., to R.A.F. Depot, on transfer to Home Estab.; 14.2.25.

Flying Officers F. J. S. Short, to No. 1 Flying Training Sch., Netheravon; 20.3.25. A. D. Stonehouse, to No. 25 Sqdn., Hawkinge; 20.3.25.

Medical Branch

Flying Officers: D. B. Smith, M.B., to Research Lab. and Medical Officers' Sch. of Instruction, Hampstead, on appointment to a Short-Service Commn. or short course; 19.3.25. T. W. Wilson, to R.A.F. Depot; 30.3.25.

Air Defence Appointment

THE War Office announces the following appointment:—Lieut.-Col. H. C. Simpson, C.M.G., D.S.O., H.P. List, to be Commander, 27th (London) Air Defence Brigade, *vice* Col. C. R. Kelly, C.M.G., D.S.O.

C.A.V. Loud Speakers

APART from the direct connection between aviation and wireless, as instanced in machine-to-ground communication, there must be a large number of our readers who are interested in the less serious but equally fascinating subject of wireless broadcasting, and to the attention of such we would bring the loud speakers produced by C. A. Vandervell and Co., Ltd., of Acton. We had an opportunity recently of testing one of the C.A.V. "Junior" loud speakers, and can state as a result that for clearness and purity the instrument is one of the best we have heard. The C.A.V. "Junior" possesses what is commonly known as a "mellow" tone, and is remarkably good as regards absence of horn resonance. The instrument was first tested on a crystal set, on an indoor aerial, about half a mile from 2LO. Music was distinctly

audible two feet from the horn. It was next tested on a single-valve reflex set seven miles from 2LO, and was found to give as large volume as most would desire for an average-size room. In order to test the loud speaker on very large volume, it was coupled to a four-valve set (1 HF., Det., and 2LF), also at seven miles from 2LO. Although the volume was terrific, there was practically no distortion, at any rate none that was traceable to the loud speaker itself. It is therefore evident that the C.A.V. "Junior" can confidently be recommended to those who set store by the purity of their reception. "Clarity And Volume" is no empty slogan, but does actually apply to the C.A.V. products.

Paris-Warsaw Air Service

OWING to the difficulties raised by Germany in regard to French machines flying over German territory, the Paris-Warsaw air service has been modified, so that the route now lies by way of Zurich, Innsbruck and Prague instead of *via* Strassburg. A new service between Paris and Constantinople *via* Innsbruck has also been started.

AIR POST STAMPS

By DOUGLAS B. ARMSTRONG

Aerogrammes

AN interesting "flown cover" from the United States bears the special marking, "Sky mail from the U.S.S. Shenandoah." It was transmitted from the U.S. Naval Air Station at San Diego to Lakehurst, N.J., and now reposes in the famous Steinmetz collection.

Special cachets (? stamps) are understood to have been applied to letters carried on the first air post flight in Persia, which took place between Teheran and Enzeli under the auspices of the Junker concern in December last.

From Vladivostock is reported a new 20-kopecs stamp, having the device of an aeroplane, printed in red, and inscribed in Russian characters "Vladivostock 1925." Its purpose is not yet revealed.

The U.S. Post Office Department has approved the use of distinctive markings for air-borne mail, and business firms are now enclosing aerial correspondence in envelopes having red, blue and white horizontal stripes boldly printed across them.

French Aero-Philatelists' Day

A DAY has been set apart for the special edification of air post collectors in the programme of the great International Philatelic Exhibition to be held in Paris in May. On that occasion those who desire it may fly to Bourget and back in postal aeroplanes, and so become familiar with the working of the French air post service. Permission has also been granted for the despatch of letters by a special air mail for which purpose a set of four semi-official vignettes of considerable artistic merit have been printed by the Maison Vaugirard in Paris, and will be sold by the Exhibition authorities exclusively. Collectors who cannot attend in person, but wish to possess souvenirs of the flight, may have letters addressed to themselves transmitted by the flight for the sum of 5 francs remitted to the Commissioners in charge of the arrangements, inclusive of a set of the special stamps.

Central American Air Post

Central and South America are becoming a fertile field for air post extension. An air mail service between the Canal zone and Costa Rica is reported as having been instituted on January 2, 1925. Special cachets are said to have been applied to the 550 letters, etc., that were carried on the first trip.

Another air mail service is believed to be in operation between certain towns in the Republic of Honduras, and here again special cachets are in use. We hope to be able to publish further details shortly.

Bolivia's National Aviation Stamps

JUST a year ago we wrote in this column regarding a proposed issue of special postage stamps to signalise the opening of a national flying school in Bolivia. The stamps are now to hand in two different designs representing aeroplanes preparing for flight, with the words "Aviacion Nacional" inscribed beneath the vignettes, all of which are printed in black. The values and colours are:—10 centavos, orange-red; 15 c. carmine, 25 c. blue on azure, 50 c. orange, 1 boliviano red-brown, 2b sepia and 5b violet. Messrs. Perkins, Bacon and Co., of London, are the printers of these handsome stamps, but it is not clear whether they are intended for air postage, nor indeed if there is any air post service at present in operation in Bolivia by which they might be used.

Air Stamps from South Africa

THE new South African air post service will certainly not fail for lack of publicity. Nothing seems to have been neglected in this line. In addition to a slogan postmark with an aeroplane device which tells the world that "Air Mail Saves Time—Lugpos Bespaar Tyd," in English and Taal, an unexpected set of four special air-post stamps was brought into use on February 25, representing different fees for aerial postage. The design shows a bi-plane in flight, against a lined background, and the denominations are:—1d. red, 3d. blue, 6d. violet and 9d. green.

They were produced by the Union Government Printing Works at Pretoria, and are the first regular postage stamps to be printed in South Africa.

First flight covers are being offered at something under 5s. each, but they are by no means plentiful, and are worth snapping up at about that figure. Those of the Capetown-Mossel Bay stage fetch a trifle more, as owing to local fog conditions the landing stage was transferred after the trial flight to Oudtshoorn.

IN PARLIAMENT

Aircraft Manufacturers and Consular Facilities

LIEUT.-COL. HENEAGE, on March 23, asked the Secretary to the Overseas Department what are the facilities afforded by consular officials to our aircraft manufacturers to encourage trading in foreign countries; and how they compare with those afforded by the representatives of France and the United States?

Mr. Samuel: Commercial diplomatic and consular officers are always ready to give assistance to aircraft manufacturers developing their trade with foreign countries. Instructions to this end have frequently been issued by my Department in consultation with the Air Ministry. All information received is passed on to firms interested. I believe that the help thus afforded by our official commercial representatives compares favourably with that rendered by the representatives of other countries.

COMPANY DOINGS

D. Napier and Son, Ltd.

THE directors' balance-sheet and report as at September 30, 1924, states that a profit on the year's trading, including interest on investments (after providing for depreciation, interest, taxation, directors' and trustees' fees, managers' commissions and contingencies), has been made, amounting to £178,927 8s. 10d. Add balance brought forward, £11,401 19s., making £190,329 7s. 10d. Deduct preference dividend paid on preference shares at 7½ per cent. per annum for the 12 months ended June 30, 1924, £22,500, leaving £167,829 7s. 10d., which the directors recommend shall be appropriated as follows:—To place to general reserve (making £250,000), £73,500; 10 per cent. ordinary dividend, £54,600; leaving a balance to carry forward of £39,729 7s. 10d.

The accounts for the year under review show the business of the company has made further marked improvement, and the company continues to improve and develop its unique position in aero-engine design and manufacture.

PUBLICATIONS RECEIVED

Revue Juridique Internationale de la Locomotion Aérienne. 1925. Edition Aérienne, 4, Rue Tronchet, Paris.

The Royal Air Force as a Career. Air Publication 1100. H.M. Stationery Office, Kingsway, London, W.C.2. Price 3s. net.

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

APPLIED FOR IN 1923

Published April 2, 1925

- 30,358. A. G. FORSYTH. Airscrews. (230,162.)
- 30,809. BARON VAN LYNDEN (R. AERNOUT). Gradient meters, clinometers, etc. (230,186.)
- 30,945. H. A. BERLINER. Helicopters. (230,190.)
- 31,393. S. E. SAUNDERS. Hulls or boats, vessels, and analogous metal structures. (230,196.)
- 32,392. F. HAMMER. Launching of torpedoes from flying machines. (222,814.)

APPLIED FOR IN 1924

Published March 26, 1925

- 573. H. J. POLLARD and BRISTOL AEROPLANE CO., LTD. Light-metal beams or spars. (229,814.)
- 1,045. A. LAMBLIN. Radiators for aeroplanes, etc. (209,769.)
- 6,386. S. G. BROWN. Gyro-compasses. (229,869.)

SECRET PATENTS RE-ASSIGNED TO THE INVENTOR

APPLIED FOR IN 1914

Published March 26, 1925

- 6,938. M. F. SUETER and D. H. HYDE-THOMSON. Torpedo-carrying seaplane.

NOTICE

Next week being Easter Week, necessitates "Flight" going to press earlier. All matter, Editorial or Advertisements, must, therefore, be received at the Offices NOT LATER than first post Monday, April 6.

FLIGHT

The Aircraft Engineer and Airships

36, GREAT QUEEN STREET, KINGSWAY, W.C. 2.
Telegraphic address: Truditur, Westcent, London.
Telephone: Gerrard 1828.

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